Filtration Standard Laboratory Module (SLM™)

General Overview of the Filtration SLM

As a result of the concentration procedure, suspended solids may precipitate from the sample solution. To avoid potential problems caused by solids within the analysis system, these solids must be filtered out of the sample. The filtration SLM is based on a carousel concept. One replaceable carousel wheel can filter eight samples. The entire carousel can then be replaced with one containing eight fresh filters.

Environmental Protection Agency (EPA) Method

Any method requiring filtration after a concentration step.

Standard Analysis Method (SAM)

Organic SAM

Advantages

The replaceable carousel concept gives the SLM the ability to be used for various filtration processes. The carousel and the free-floating injection clamp with filter interface can be altered to accept an alternate filter with very little effort.

General Description of the Filtration SLM

In the current, manual procedure, a syringe is used to draw approximately 10 mL of sample through a paper filter. If the solids content is high, the filter holder must be disassembled to replace the paper filter and then reassembled, often three to four times per sample. The filtration SLM is based on a carousel concept that will position a Whatman Polydisc TF 50-mm filter into a free-floating injection clamp with a specially designed filter interface.

The filtration SLM is designed to interface with the Fluid Transfer Standard Support Module (SSM). The link between the SSM and the SLM is accomplished by 1/8-inch

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Figure 1. Filtration SLM.

Teflon tubing and Teflon bulkhead fittings mounted on the SLM. The filtered extract can exit the SLM via tube transfer, or it can be injected into a glass vial for storage. The filtration SLM is also capable of operation without the Fluid Transport SSM. In this mode the filtered sample is returned to the original 10-mL vial after the vial has been rinsed.

The system will not operate in a stand-alone manner; it requires instructions from a host controller. The SLM will receive operating instructions, such as where to route the filtered extract and which filter to use, via an RS-232 serial communications port. After the instructions have been received, the SLM can execute the task. It will select a filter, filter the extract, rinse itself, and route the extract and rinse to their respective destinations.

Control of the SLM is provided by an STD Bus computer with all the operational programming resident on the unit. Programming of the computer is achieved through an RS-232 communication port connected to a personal computer. Operating status of the SLM is monitored by two, double-unit, multiple-fiber optic controllers using visible red light, Hall-effect sensors, an optical encoder, and an ultrasonic bubble sensor. The instrument can perform tasks autonomously or in combination with other CAA equipment.

The SLM is designed for a filtering capacity of 700 mL / min at a pressure of 10 psi.

Status

The filtration SLM is currently available for licensing. Other arrangements such as Cooperative Research and Development Agreements are negotiable. The overall objective is to transfer this technology into industry, where it can be developed and marketed to meet the needs of the Department of Energy and other interests.

Industrial Partner

SciBus Analytical, Inc.

Developers

Office of Research and Technology Applications, Idaho National Engineering Laboratory.

SciBus Analytical
The Integration of Science and Business

Battelle
Pacific Northwest Laboratories

INEL

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